

Evaluation of activated charcoal as treatment for Yellow tulp (*Moraea pallida*) poisoning in cattle

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ABSTRACT

The efficacy of activated charcoal as a treatment for cattle ($n = 57$) poisoned by Yellow tulp (*Moraea pallida*) was investigated. Treatment with activated charcoal resulted in full recovery, irrespective of the degree of posterior paresis, provided that this clinical sign did not develop within the first 12 hours after initial exposure to Yellow tulp-infested grazing. For instance, despite treatment, 1 of 7 cattle succumbed after manifesting mild posterior paresis 6 to 8 h after initial exposure and 3 of 3 treated cattle died after developing severe posterior paresis within 6 to 12 h.

Keywords: activated charcoal, *Moraea pallida*, treatment, Yellow tulp poisoning.

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Cardiac glycoside-containing plants, of which Yellow tulp (*Moraea pallida* Bak., Iridaceae) (Fig. 1) is the most important member, are collectively the main cause of livestock poisoning in southern Africa³. In South Africa, c. 33 % of the mortalities in cattle caused by plant poisonings and mycotoxins are attributed to these plants, which may affect the cardiovascular, gastrointestinal, nervous and/or respiratory systems³. Peracutely affected animals may die suddenly due to cardiac arrest, even after the slightest exertion³. Joubert and Schultz successfully used activated charcoal as remedy for stock experimentally dosed with Blue tulp (*Moraea polystachya*)^{1,2}. However, except for limited evidence from previous trials⁷, few critical data are available on the efficacy of the treatment of Yellow tulp poisoning on naturally infested grazing. Retrospective data from past trials^{4–6} on Yellow tulp-infested pastures were used in this study to evaluate the efficacy of the treatment.

The cattle ($n = 57$) used in the above-mentioned studies were Nguni, Bonsmara and Friesians, between 10 months and 2 years of age. The majority of these animals were steers, but some heifers

were also included. The animals, all of which were naive because they had never been exposed to tulp, were all newly introduced onto Yellow tulp-infested grazing at the various experimental sites. Posterior paresis³, an easily recognisable clinical aberration in the field, was used as parameter to evaluate the extent to which animals were affected. All cattle showing moderate (walking with difficulty and a swaying hindquarter) and severe (unable to remain in a standing position) signs of posterior paresis were dosed with activated charcoal (Carbopal-Gn-H, Kyron Laboratories) at a rate of 2 g/kg body weight^{1,2} using a stomach tube. Only 12 of 29 cattle showing mild signs of posterior paresis (ambulatory, but gait slightly affected) were treated with activated



Fig. 1: Yellow tulp (*Moraea pallida*).

charcoal. The recovery of paretic cattle treated with activated charcoal at various intervals following initial exposure to Yellow tulp-infested grazing, is shown in Table 1.

The following observations were made:

- Posterior paresis developed within 6 to 24 hours after initial exposure to Yellow tulp-infested grazing. In a few cases, however, mild signs of posterior paresis were only noticed 48 hours after initial exposure to Yellow tulp-infested grazing.
- Cattle showing *mild signs* of posterior paresis 24 hours after initial exposure to Yellow tulp-infested grazing, recovered

Table 1: Response of cattle to treatment with activated charcoal after exhibiting different degrees of posterior paresis at various intervals following continuous exposure to Yellow tulp-infested grazing.

Degree of posterior paresis	Interval from initial exposure to treatment (h)	Number of cattle ($n = 57$)	
		Recovered ($n = 53$)	Died ($n = 4$)
Mild	6–8	6	1
	16	1	0
	24	4	0
Moderate	12	7	0
	24	15	0
	48	2	0
Severe	6	0	2
	12	0	1
	24	16	0
	48	2	0

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completely, irrespective of whether they were treated with activated charcoal or not. Mild signs of posterior paresis within 8 hours after initial exposure to Yellow tulp-infested grazing, however, indicated severe poisoning. Some of these cattle also manifested mild signs of ruminal bloat, appeared uncomfortable, salivated, and exhibited respiratory problems when handled. One animal died, despite immediate treatment with activated charcoal. Recovery of the cattle that survived with treatment was slow and most of them developed moderate signs of posterior paresis at a later stage.

- All cattle treated with activated charcoal when showing *moderate signs* of posterior paresis 12, 24 and 48 hours after initial exposure to Yellow tulp-infested grazing, recovered fully. The occurrence of moderate signs of posterior paresis within 12 hours from initial exposure to Yellow tulp-infested grazing, however, should be regarded as a severe form of Yellow tulp poisoning that needs immediate treatment in order to prevent possible deaths or a prolonged recovery period.
- Treatment with activated charcoal when showing *severe signs* of posterior paresis 24 and 48 hours after initial exposure to Yellow tulp-infested grazing resulted in complete recovery. However, when severe signs of posterior paresis developed within 6 to 12 hours after initial exposure to the Yellow tulp-infested grazing, mortalities could not be prevented by treatment with activated charcoal.

The retrospective data indicate that activated charcoal was highly effective in treating cattle poisoned by Yellow tulp under natural grazing conditions, provided that a severe degree of posterior paresis did not develop within the first 12 hours after initial exposure to Yellow tulp-infested grazing. Cattle treated when showing mild signs of posterior paresis within the first 8 hours appeared to be at risk. The fact that none of the untreated cattle died is an indication that posterior paresis might be a reliable clinical sign to diagnose tulp poisoning. These observations might be used as a practical guideline for treatment of cattle poisoned with Yellow tulp in the field.

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